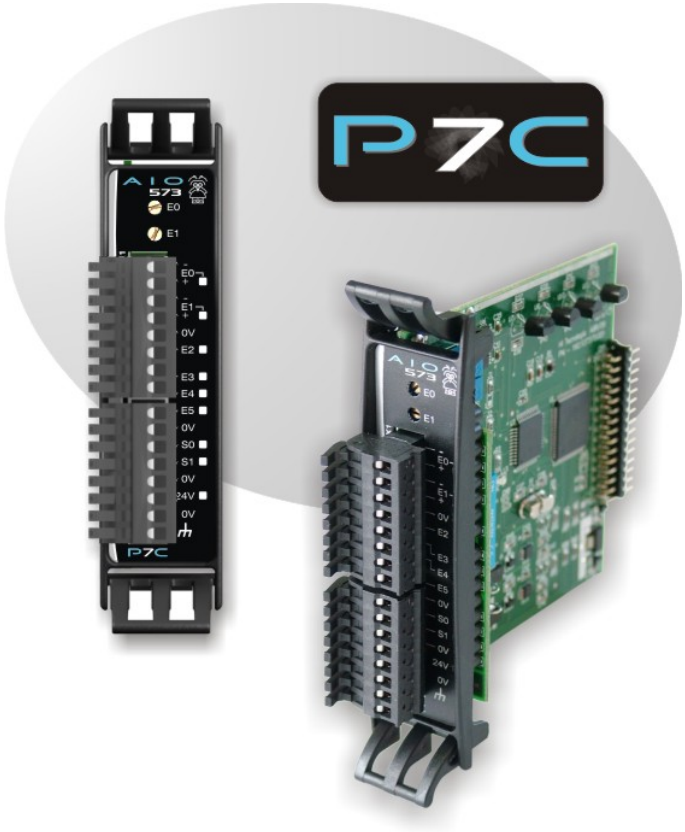
AIO571/573 Modules

P7C Controller – HI tecnologia

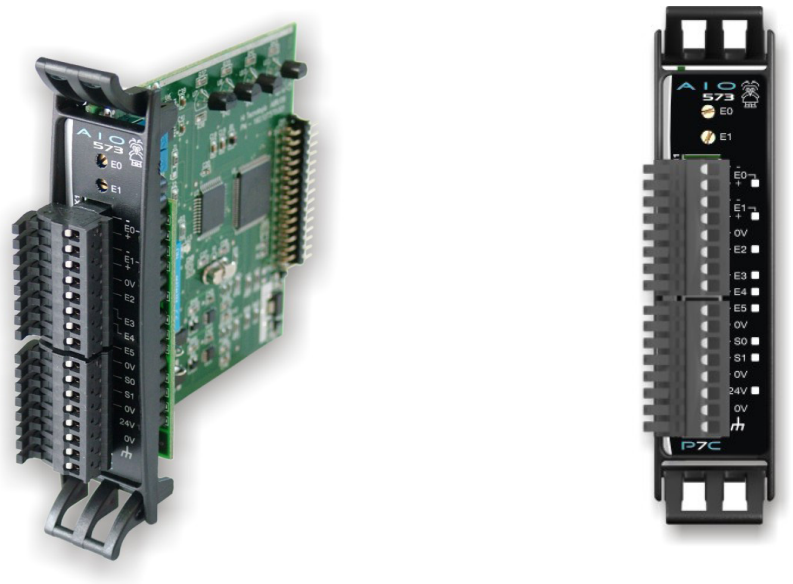


The content of this document is part of P7C User Manual (PMU1070011). The Notes and Acronyms full list is at the complete version of the manual. To get it, please, access: www.hitecnologia.com.br

09 AIO571/573 Technical Specifications

Presentation

AIO571/573 are the P7C[1] analog inputs, outputs and pt100 channels modules, providing to the user 4 analog inputs channels of 10 bits[1] resolution (configurable for current or voltage), 2 analog outputs of 10 bits[1] resolution and 2 channels with inputs for pt100 (3 wires), all them with individual leds to indicate the status leds. Module with automatic addressing, being allowed the simultaneous use of modules at P7C[1].



Compatible with the module AIO571
Note: The modules can have lever connectors (for the new modules) or screw connectors.

Compatibility

The following table presents the CPU modules compatible with the modules used:

	P7C Controller	
Module	CPU300	CPU301
AIO571*	Yes	Yes
AIO573	No	Yes

(*) – It must not be used with controllers that have 2 expansion racks

1 - Check the Notes and Acronysms List at the beggining of this document

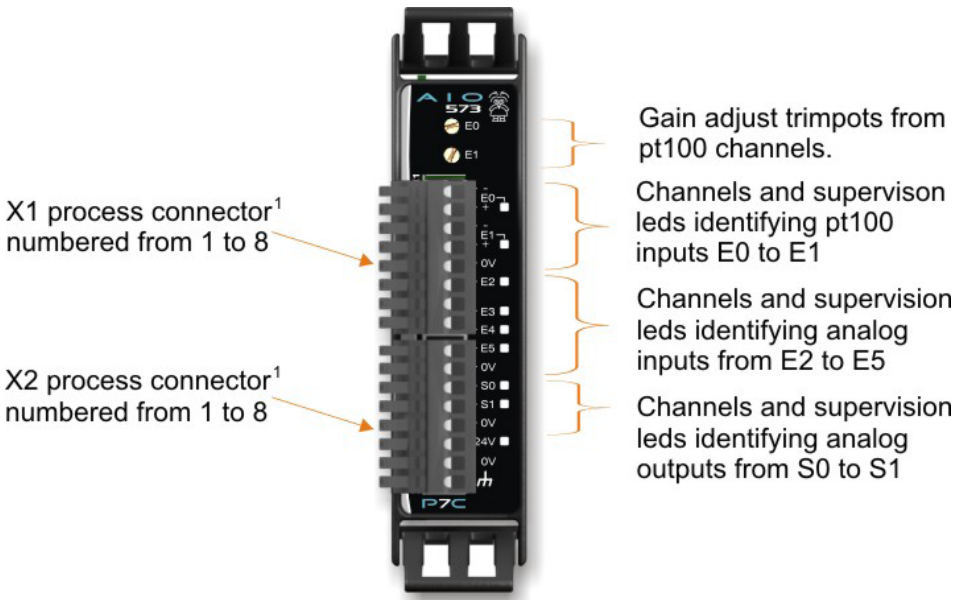
Technical Specifications

Power Supply	5 Vdc (supplied by main rack)
Consumption	0,7 W
Operation temperature	0 to 60 °C
Storage temperature	-25 °C to 80 °C
Humidity	≤90% without condensation
Module weight	0,06 Kg approximately
Dimensions	85 (W) x 83 (H) x 27 (L) mm

Technical Data – Input / Output

PT100 input	2 pt100 (3 wires) sensor channels, with the standard operation range of -10 ... +150 °C. Reading maximum error 0,5% full scale
Analog input	4 10 bits[1] resolution channels with option of connections with signals from 0 to 20 mA[1], 4 a 20 mA[1] (impedance[1] of 125 Ω) and 0 to 10 Vdc (impedance[1] of 10 KΩ)
Analog input protection	Against overvoltage
Analog output	2 10 bits[1] resolution channels for signals from 0 to 20 mA1 or 4 to 20 mA[1]
Analog output protection	Short-circuit protected

Process Interface



Compatible with the module AIO571
Note: The modules can have lever connectors (for the new modules) or screw connectors.

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Connections

The modules AIO571/573 have two process interface connectors[1], identified as X1 (8 terminal blocks[1]) and X2 (8 terminal blocks[1]). These terminal blocks[1] are numbered as the following tables will show:

X1 Terminal Block[1]	Signal
1	E0 temperature sensor negative input
2	E0 temperature sensor positive input
3	E1 temperature sensor negative input
4	E1 temperature sensor positive input
5	Analog inputs reference (0V)
6	E2 analog input channel
7	E3 analog input channel
8	E4 analog input channel

X2 Terminal Block[1]	Signal
1	E5 analog input channel
2	Analog inputs reference (0V)
3	S0 analog output channel
4	S0 analog output channel
5	Analog outputs reference (0V)
6	Analog outputs supply
7	Analog outputs power supply reference
8	Cable shielding

IMPORTANT: The analog outputs need an external 24Vdc power supply, that can be connected at the terminal blocks[1] X2-6 (24vdc) and X2-7 (0V).
For analog signals, use cables with shielding, connecting them to the terminal block[1] X2-8.

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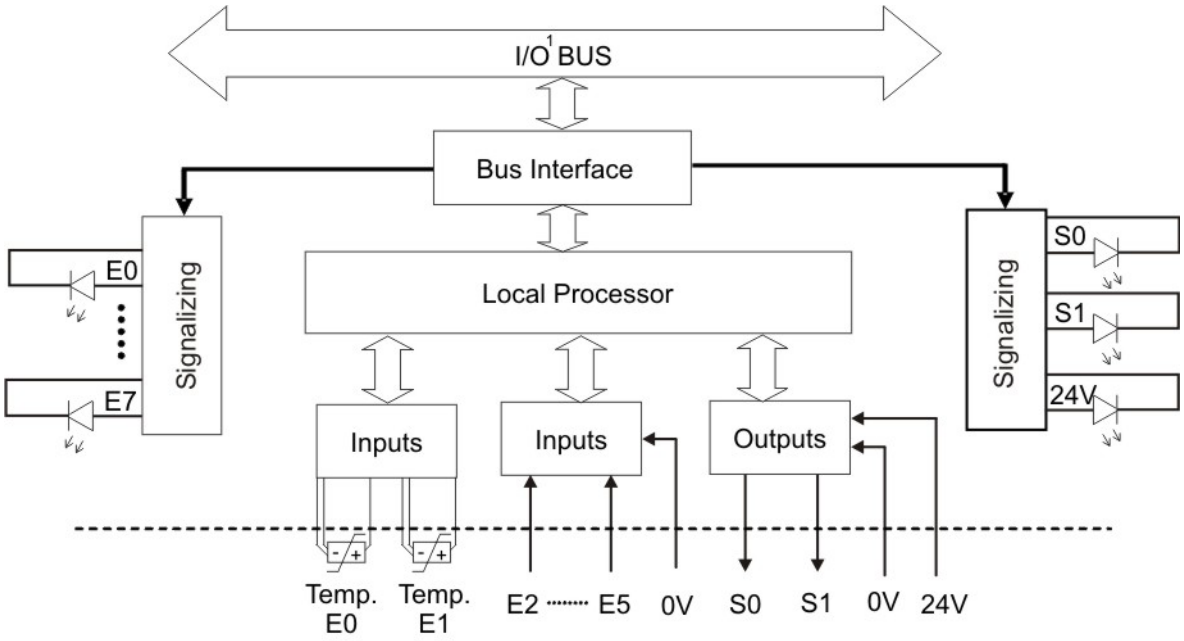
Block Diagram

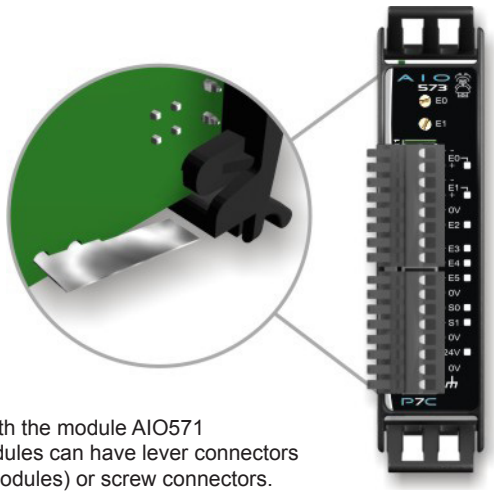


Ground connector

There are two ground connectors at the module side, which are responsible for the contact with the main rack structure.

CAUTION

IMPORTANT: When handling the module, be careful to not hurt yourself with the ground connectors, because they have a sharp surface.



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Module Addressing

The modules AIO571/573 have not addressing configuration using hardware (strap[1] / switch). It is provided automatically by the controller firmware when connected to the rack.

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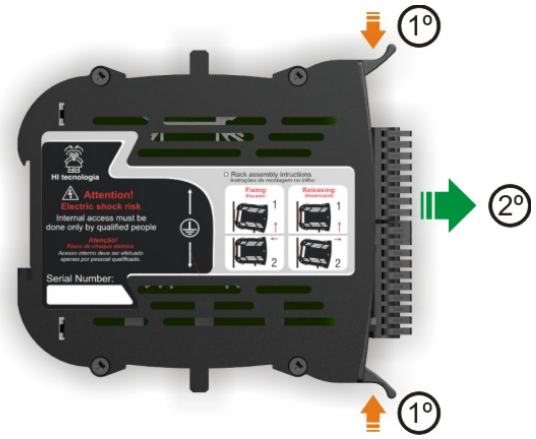
Removing the module from the rack

AIO571/573 modules CAN be replaced with the device turned on (Hot Swap[1]).

To remove the module from the main rack, push the two locks, one against the other, to unlock the plastic frontal. At this moment, pull them in order to remove them from the rack.



1º - Press the locks, one against the other, using the two hands (it is not necessary to use a lot of force for that, just the enough to unlock. Each lock needs be moved at +/- 3mm (as indicated at the picture).
2º - With the locks pressed, pull them in order to disconnect the module from the rack (as indicated at the picture).

Configurations

The analog inputs E2, E3, E4 and E5 are configurable by using a keys set available on a Dip Switch[1] (SW1). The access to the keys is at the module component face. The others configurations of the module are executed using an specific software (SPDSW[1]).

Analog Input	DIP8 SW1	Current	Voltage
E2	1	ON	OFF
	2	OFF	ON
E3	3	ON	OFF
	4	OFF	ON
E4	5	ON	OFF
	6	OFF	ON
E5	7	ON	OFF
	8	OFF	ON

IMPORTANT: The current offset 0 to 20mA[1] or 4 to 20mA[1] is configured using SPDSW[1] from the version 2.x.xx on

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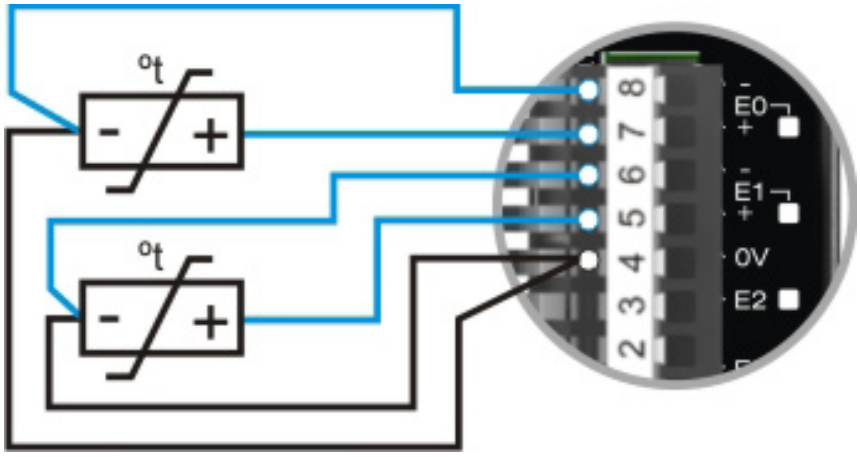
Pt100 Inputs utilisation examples

The inputs E1 and E0 connection scheme, when connected to the sensor pt100 (3 wires), will be exemplified as it follows:

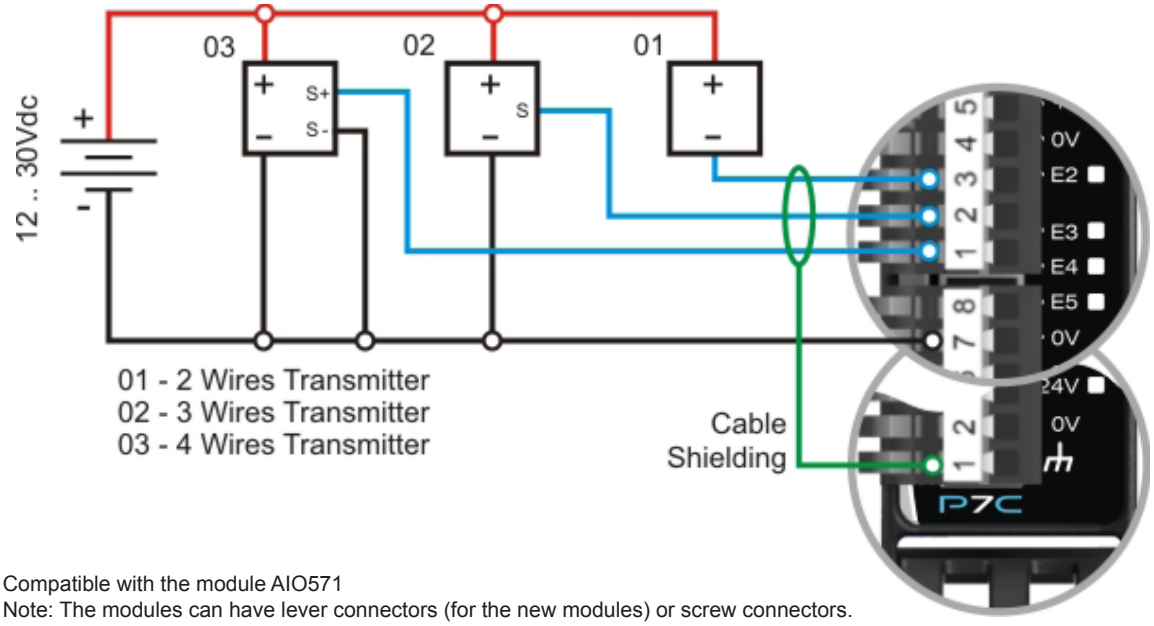


In this case, the PLC[1] will be able to read the temperature at channels E0 and E1. The standard range is -10 to +150ºC, and full scale can be calibrated from -120 to +250ºC. The reading maximum error is 0,5% full scale. The Pt100 second negative input must be connected to signal 0V (X1-5).

The temperature values provided by the module for the Ladder program are set in Celsius degrees x 10, thus:

Standard Temp. [ºC]	Value obtained from Ladder program	Description
-10 to +150	-100 to 1500	-100 = -10.0ºC 1500 = 150.0ºC

Utilisation examples of analog inputs of instrumentation



Compatible with the module AIO571
Note: The modules can have lever connectors (for the new modules) or screw connectors.

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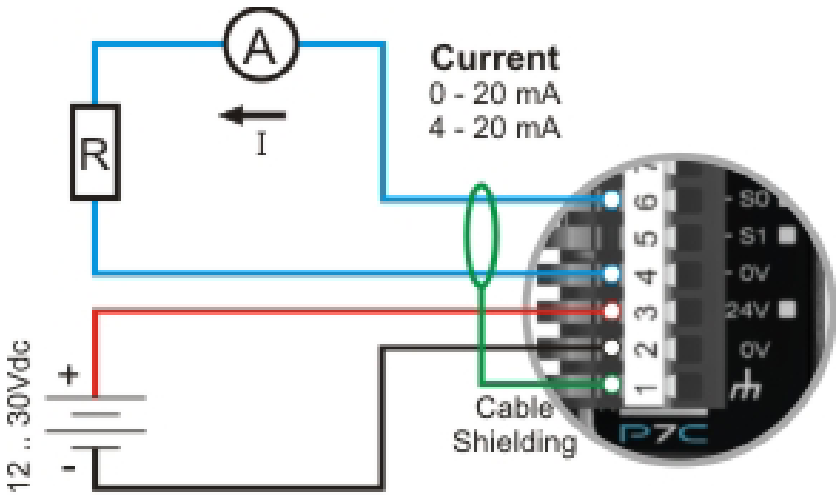
Utilisation examples of analog outputs of instrumentation



Operation from 0 to 10V

The analog input can operate on a range from 0 to 10V. In this case, the configuration from 0 to 20mA[1] must be kept and it also must be closed the configuration strap associated to the output.

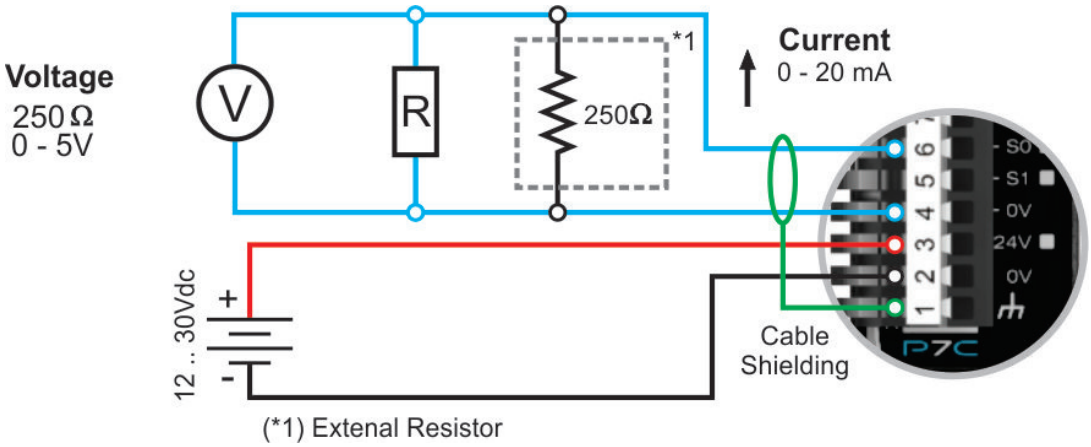
Strap J3 – Related to S0 output
Strap J4 – Related to S1 output

Others voltage configurations

It is possible to obtain other voltage ranges by using an external resistor, as the following example shows:

- By using a 250Ω external resistor it is possible to obtain a range from 0 to 5V.

ATTENTION: To use an external resistor, keep straps J3 and J4 open.



Compatible with the module AIO571
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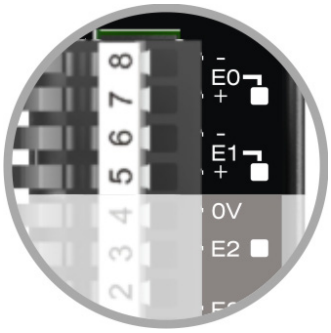
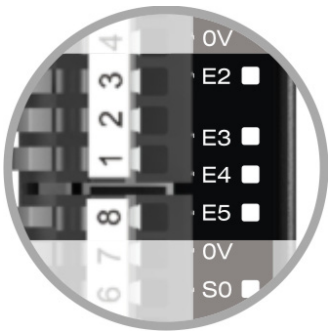
Process interface leds operation

pt100 inputs, configured at the range from -10 to +150ºC



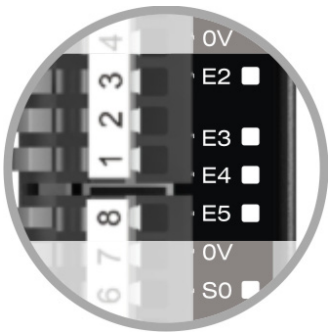
Leds	Status	Condition	Diagnosis
E(0 and 1)	On	pt100 sensor connected	Operational channel
E(0 and 1)	Off	pt100 sensor negative input disconnected	Sensor fail, disconnected, equipment turned off or analog module parameterization fail

Analog inputs, configured for current at the range from 4 to 20 mA[1]



Leds	Status	Condition	Diagnosis
E(2 and 5)	On	There is current signal at the input	Operational channel
E(2 and 5)	Off	There is no current signal at the input or current smaller then the range configured	Open channel, equipment turned off or parameterization fail of the analog module

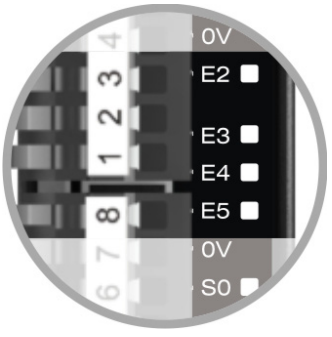
Analog inputs, configured for current at the range from 0 to 20 mA[1]



Leds	Status	Condition	Diagnosis
E(2) to E(5)	On	*Note1	Operational channel
E(2) to E(5)	Off	Inoperational channel	Equipment turned off or parameterization fail of the analog module

*Note1: When the channel off-set (Current/Voltage) is zero, the condition “led on” indicates that the channel is operational.

Analog inputs, configured for voltage at the range from 2 to 10V



Leds	Status	Condition	Diagnosis
E(2 and 5)	On	There is voltage signal at the input	
E(2 and 5)	Off	There is no voltage signal at the input or voltage smaller then the range configured	Open channel, equipment turned off or parameterization fail of the analog module

Compatible with the module AIO571
Note: The modules can have lever connectors (for the new modules) or screw connectors.

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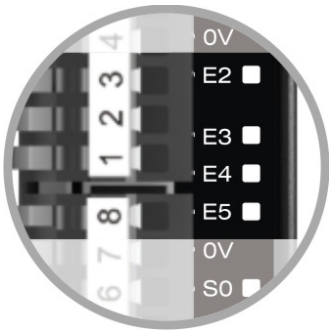
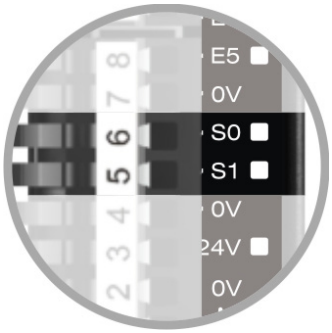
Analog inputs, configured for voltage at the range from 0 to 10 V



Leds	Status	Condition	Diagnosis
E(2) to E(5)	On	*Note1	
E(2) to E(5)	Off	Inoperational channel	Equipment turned off or parameterization fail of the analog module

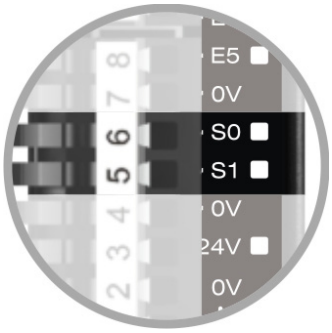
*Note1: When the channel off-set (Current/Voltage) is zero, the condition “led on” indicates that the channel is operational.

Analog outputs, configured for current at the range from 4 to 20 mA[1]



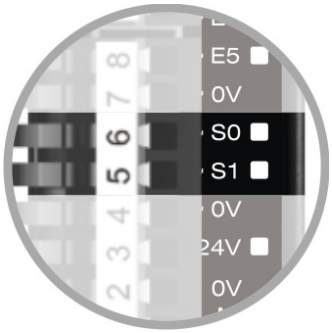
Leds	Status	Condition	Diagnosis
S (0 and 1)	On	Detected connection with the process	
S (0 and 1)	Off	No connection with the process	Equipment turned off or parameterization fail of the analog module

Analog outputs, configured for current at the range from 0 to 20 mA[1]



Leds	Status	Condition	Diagnosis
S (0 and 1)	On	Detected connection with the process	
S (0 and 1)	Off	No connection with the process	Equipment turned off or parameterization fail of the analog module

Analog outputs, configured for voltage at the range from 0 to 10 V



Leds	Status	Condition	Diagnosis
S (0 and 1)	On	Continuously ON, not depending on the output (if it is connected to the process or not)	
S (0 and 1)	Off	No 24V power supply	Equipment turned off or module not operational

Compatible with the module AIO571
Note: The modules can have lever connectors (for the new modules) or screw connectors.

1 - Check the Notes and Acronysms List at the beggining of this document

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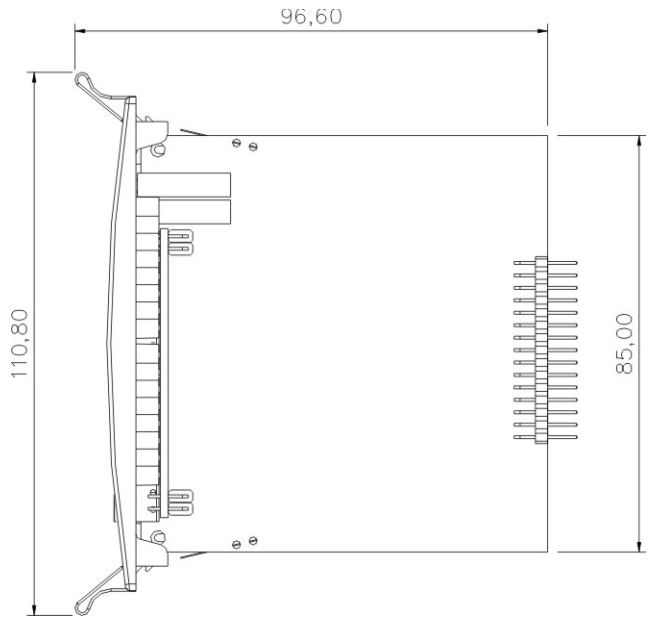
24Vdc module power supply

Leds	Status	Condition	Diagnosis
24V	On	There is analog output power supply	
24V	Off		Equipment turned off or module not operational
24V	Blinking	There is no analog output power supply	

Compatible with the module AIO571
Note: The modules can have lever connectors (for the new modules) or screw connectors.

Dimensions (mm)



Product Part Number

Part Number	Identification
300.107.571.000	Module with 2 pt100 (3 wires) inputs, 4 analog inputs and 2 analog outputs (compatible with CPU300/301)
300.107.573.000	Module with 2 pt100 (3 wires) inputs, 4 analog inputs and 2 analog outputs (compatible with CPU301)

1 - Check the Notes and Acronysms List at the beggining of this document